DOCUMENT RESUME

ED 306 725 EC 212 789

TITLE	Evaluating Students with Hearing Impairment. Technical Assistance Document.
INSTITUTION	New Jersey State Dept. of Education, Trenton. Div. of Special Education.
REPORT NO	PTM-700.22
PUB DATE	Sep 87
NOTE	98p.
PUB TYPE	Guides - Non-Classroom Use (055)
EDRS PRICE	MF01/PC04 Plus Postage.
DESCRIPTORS	*Auditory Tests; Cognitive Style; Cognitive Tests; *Educational Diagnosis; Elementary Secondary Education; *Evaluation Methods; *Handicap Identification; *Hearing Impairments; Language Tests; Learning Modalities; Legal Responsibility; Preschool Education; Psychological Evaluation; Social Development; Speech Tests; State Programs; *State Standards; Student Evaluation
IDENTIFIERS	*New Jersey

ABSTRACT

This guide, written to assist child study teams in New Jersey, reviews legal and other requirements in evaluating students with hearing impairments. Implications of hearing impairment for the evaluation process include its impact on syntactic, semantic, and pragmatic aspects of language; environmental interaction; and social interaction. Development of an evaluation plan involves information gathering, selecting evaluation procedures, considering communication method, selecting a case manager, and selecting tests. The audiological evaluation uses such measurement techniques as pure tone audiometry, tympanometry/reflex testing, speech audiometry, hearing aid evaluation, and measures of central auditory processing. The speech-language assessment determines the child's native language and primary mode of communication, and subsequently examines the oral mechanism, articulation, voice and fluency, and receptive and expressive language. Social evaluation considers family history, developmental history, medical information, communication, educational history, community/social experiences, and adaptive behavior. The psychological evaluation measures visual-motor integration, cognition and intelligence, adaptive behavior, and socio-emotional development. A learning evaluation evaluates learning style, current levels of functioning, and appropriate instructional strategies and learning environments. Final chapters address evaluation of students with additional handicapping conditions and offer general programming considerations. For each type of assessment, important factors in determining the expertise of the examiner are noted. (JDD)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

ED306725

TECHNICAL ASSISTANCE DOCUMENT

Evaluating Students with Hearing Impairment

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)
This document has been reproduced as received from the person or organization originating it.
Minor changes have been made to improve reproduction quality.
Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY
Richard Vespucci
TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

NEW JERSEY STATE DEPARTMENT OF EDUCATION

DIVISION OF SPECIAL EDUCATION

EC 213789

BEST COPY AVAILABLE

EVALUATING STUDENTS WITH HEARING IMPAIRMENT

Saul Cooperman
Commissioner of Education

Jeffrey V. Osowski, Director
Division of Special Education

Eugene A. Goldman, Manager
Bureau of Policy and Planning

Regina A. Barna, Editor
Hearing Impaired Consultant

Editorial Committee

Israela Franklin, Hearing Impaired Consultant
Therese Garavente, Hearing Impaired Consultant
Jerry G. Petroff, Title VI-C Coordinator
Dennis Russell, Coordinator of Deaf Education

New Jersey State Department of Education
225 West State Street
CN 500
Trenton, New Jersey 08625

September, 1987

PTM 700.22

STATE BOARD OF EDUCATION

JOHN T. KLAGHOLZ..... Seaside Park
President

JAMES JONES..... Teaneck
Vice President

S. DAVID BRANDT..... Cherry Hill

MAUD DAHME..... Annandale

BETTY A. DEAN..... East Orange

MATEO F. DeCARDENAS..... Union City

ANNE S. DILLMAN..... Perth Amboy

ALICE A. HOLZAPFEL..... Elizabeth

NANCY SCHAENEN..... Madison

JAMES M. SEABROOK, SR..... Bridgeton

ROBERT A. WOODRUFF..... Elmer

DEBORAH P. WOLFE..... Cranford
Representing the State Board of Higher Education

Saul Cooperman, Commissioner of Education
Secretary

T. Edward Hollander, Chancellor of Higher Education
Ex-Officio

NEW JERSEY STATE DEPARTMENT OF EDUCATION
225 West State Street
CN 500
Trenton, New Jersey 08625
(609) 292-0147

DIVISION OF SPECIAL EDUCATION

Coordinator of Deaf Education - Dennis Russell

Regional Consultants for the Hearing Impaired

Regina Barna - Bureau of Programs and Services, North I (Hudson, Passaic, Morris, Sussex, Warren)

Vacant - Bureau of Programs and Services, North II (Bergen, Essex)

Therese Garavente - Bureau of Programs and Services, Central (Hunterdon, Mercer, Middlesex, Monmouth, Ocean, Somerset, Union)

Israela Franklin - Bureau of Programs and Services, South (Atlantic, Burlington, Camden, Cape May, Cumberland, Gloucester, Salem)

Title VI-C Coordinator (Deaf-Blind) - Jerry G. Petroff

SPECIALIZED CHILD STUDY TEAMS
(funded in part by EHA-B)

Northern Child Study Team for the Hearing Impaired
Norman A. Bleshman Regional Day School
333 E. Ridgewood Avenue
Paramus, New Jersey 07652
Kevin Brennan, Program Director
(201) 262-8666

Neptune Township Schools
Deaf Education Cooperative Project
Neptune Junior High School
Heck Avenue
Neptune, New Jersey 07753
Susan Preston, Coordinator
(201) 776-2023

PREFACE

The purpose of this document is to assist local child study teams in making informed decisions regarding their ability to evaluate hearing impaired children. There are currently two specialized child study teams in New Jersey who are available to local teams for the evaluation of this low-incidence population. Although these teams have the necessary skill and expertise to conduct such evaluations, we recognize that, for a number of reasons, local child teams may choose to administer their own assessments. Our intent is neither to encourage nor to discourage local teams from undertaking this responsibility. Rather, we wish to clearly define what knowledge and skills each examiner must possess in order to perform an unbiased assessment. We begin with the premise that our readers understand that expertise is not merely a matter of knowledge and skills learned in schools, but includes understanding developed through experience with testing hearing impaired students. We leave it for readers to judge their own abilities and to make ethical decisions regarding this matter.

In the pages that follow, we have been specific as to what is unique about testing hearing impaired children. Our convention has been to delineate what qualified examiners do, not what they ought to do. We do not expect these guidelines to teach how to do individual discipline evaluations, or who should do them. If local child study teams decide to use outside evaluators, the document provides a guide to the kinds of information that they should expect from these consultants. How examination results and findings of other specialists are used in the determination of eligibility for special education and/or related services and in the development of an individualized education program remains the responsibility of the local child study team.

Hearing Impaired Committee

ACKNOWLEDGEMENTS

The Committee for the Hearing Impaired in the Division of Special Education has written this guide with the help of several consultants and many reviewers. We would especially like to thank those professionals who provided the early drafts of specialized sections: Annette Zaner, Sara Strohmeier, Nancy Hovey, Kristin Nowell and Rose Mary Briggs. As our concepts and objectives of the document changed, so too did the content of these first drafts.

Contributing greatly to the practicality and usefulness of the guide have been the efforts and advice of the practitioners in the field, particularly the two specialized child study teams for the evaluation of hearing impaired students: the Northern Child Study Team operating through the Special Services School District of Bergen County, and the Neptune Child Study Team located at Neptune Township Schools.

We especially appreciate the gracious support of our colleagues in the Division of Special Education, as well as professionals and parents throughout the state, whose critical reviews of the draft contributed to making this document eminently more readable and useful. A special note of thanks must be extended to Dr. Robert Woods, an educator and audiologist, who contributed many hours of his time to this project.

We would particularly like to express our gratitude to the thoughtful champion of our project from its inception several years ago to its final completion. Gene Goldman believed in the pragmatic value of our efforts, encouraging us when the task seemed to move too slowly or when we began to question the basic tenets of the project.

This booklet is a Learning Resource Center (LRC) project funded under EHA-B.

TABLE OF CONTENTS

		Page
Preface		vii
Acknowledgements		ix
Introduction	Legal Requirements in Evaluation	1
Chapter 1	Implications of Hearing Impairment for the Evaluation Process	4
Chapter 2	General Considerations in Evaluation	9
Chapter 3	Audiological Evaluation	17
Chapter 4	Communication Evaluation	33
Chapter 5	Social Evaluation	43
Chapter 6	Psychological Evaluation	60
Chapter 7	Learning Evaluation	69
Chapter 8	Evaluation of Students with Additional Handicapping Conditions	76
Chapter 9	General Considerations for Programming	82

INTRODUCTION

LEGAL REQUIREMENTS IN EVALUATION

The New Jersey Constitution, statutes, and administrative code establish statewide standards for a thorough and efficient education. Each local district is responsible for its own specific goals and for providing its children with the educational programs required to meet these goals.

For handicapped children, the overall goals of education remain the same; that is, to develop the basic skills of communication and computation, to develop a store of general information, to prepare them for the world of work, and to prepare them to live independent and self-directed lives.

However, the educational program of each handicapped child must be designed in a way that considers the current educational status of the child and the ways in which the child can be appropriately educated.

The educational evaluation is the process by which the local district and parents determine the most appropriate program for a child in light of the school's overall goals and the child's abilities. The evaluation is the key to developing a thorough and efficient educational program.

State and federal regulations address the educational evaluation. N.J.A.C. 6:28-3.4 outlines New Jersey's procedural requirements. Students suspected to be educationally handicapped and referred to the child study team are required to undergo an audiometric screening according to N.J.A.C. 6:29-8. For students who fail this screening, it is essential that the team determine the characteristics of any existing hearing impairment and its effect upon the child's development.

The Code of Federal Regulations (CFR) under the Education of the Handicapped Act sets forth minimum requirements for non-discriminatory testing. These requirements are also implicit in N.J.A.C. 6:28-3.4. Prior to any formal testing it is necessary to determine the child's native language and the mode of communication normally used by the child. Federal regulations, 34 CFR 300.532(a), require that the child be tested in his/her native language or other mode of communication whenever feasible. For children who communicate using sign language, the implications of this requirement are clear: testing must be conducted using the child's sign system. Testing children with impaired hearing who do not use sign language may require modifications which are not as obvious.

In addition, the native language requirement, 34 CFR 300.532 also requires that the tests be validated for the purposes for which they are used and that they must be administered by trained personnel. The examiner must ascertain that a test does not inadvertently assess impaired sensory, manual or speaking skills.

In New Jersey, students who are eligible for special education and/or related services because of an educationally significant hearing impairment are classified as "auditorily handicapped." N.J.A.C. 6:28-3.5(e)1 defines auditorily handicapped as an inability to hear within normal limits due to a physical impairment or dysfunction of the auditory mechanism characterized as follows: the pupil is impaired in processing linguistic information through hearing, with or without amplification; and the loss of hearing may be permanent or fluctuating and adversely affects the pupil's education.

N.J.A.C. 6:28-3.5(e)1 further requires that an audiological and communication evaluation be completed for each student suspected to be auditorily handicapped. These evaluations are in addition to the general requirements for a comprehensive evaluation which are set forth in N.J.A.C. 6:28-3.4.

Federal regulations, 35 CFR 300.5(b) more specifically define the terms "deaf" and "hard of hearing." Deaf means a hearing impairment which is so severe that the child is impaired in processing linguistic information through hearing, with or without amplification, which adversely affects educational performance. Hard of hearing means a hearing impairment, whether permanent or fluctuating, which adversely affects a child's educational performance but which is not included under the definition of "deaf" in this section.

The distinction between deaf and hard of hearing is not required for classification purposes. However, it is a distinction which is critical in the development of appropriate programming and in the determination of the least restrictive environment.

CHAPTER 1

IMPLICATIONS OF HEARING IMPAIRMENT FOR THE EVALUATION PROCESS

A child study team preparing to evaluate a hearing impaired student is asked to evaluate the impact of an invisible disability upon the student's learning style and potential. Frequently, the ramifications of this silent handicap are underestimated because the hearing loss does not call attention to itself by any physical abnormality. In what ways are hearing impaired students different from other special education students? What are the special factors to be considered in developing an evaluation plan and in selecting evaluators?

Although most people are aware of the linguistic and communication deficits resulting from a hearing impairment, they are not cognizant that this disability has an impact upon every major life function. Hearing impaired students will experience environmental and social deprivation which will affect their cultural choices as well as their interpersonal relationships. Although the effects of hearing loss upon language, environmental and social factors in a student's life are evaluated at a discrete point in time, they must also be considered in the context of the student's entire life.

IMPACT OF HEARING LOSS ON LANGUAGE DEVELOPMENT

Most hearing impaired students have not had a typical, natural interaction with the environment. When there is an impaired sense, there is a disruption in the interaction process and, therefore, there is a disruption in typical language acquisition and development. The course of language development, which for hearing students happens intrinsically and naturally, must be acquired extrinsically by hearing impaired students.

The syntactic, semantic and pragmatic aspects of language are all affected by a hearing loss. During the evaluation of hearing impaired students, grammar and vocabulary difficulties are usually apparent. However, the deficits in the pragmatic use of language, which is most fundamental, may not be as obvious.

The pragmatic use of language is described by Hocketts (1958) as having essentially four major characteristics. First, it is creative and allows a student to put together new forms and discover new and different schemas. Second, language is the way a student can describe the abstract as well as the concrete. Feelings, emotions, desires and needs can all be expressed through language. Third, language has a displacement ability in which one can discuss the past, the present and the future and integrate meaning into time categories. Finally, language facilitates learning and becomes the foundation for all other content areas.

Before evaluating a hearing impaired student, it is critical for the evaluator to understand unique language development problems as well as normal language acquisition. Assessment and evaluation tools rely heavily upon language as the organizational code. During the evaluation process, students express their creativity, emotions, and feelings, discuss time in the framework of yesterday, today, and tomorrow, and answer questions in the content areas (i.e., mathematics, science and social studies).

IMPACT OF HEARING LOSS UPON ENVIRONMENTAL INTERACTION

Because students learn from the environment through the senses, and because each sense has unique characteristics, the visual channel and the auditory channel by which information is relayed are also unique.

Hearing is the sense which continuously provides information day and night. The sense of hearing is all-directional and is essentially passive. Individuals hear sounds in front, behind and on either side of them. This sense allows individuals to interact within a group and, while focusing on one person, to hear the sounds of many other conversations at the same time. Therefore, the auditory channel is the channel which can provide multiple sources of information simultaneously. The child listening to a teacher give directions will also be aware that the bell rang for lunch, the school band is rehearsing, and it is beginning to rain outside. To receive this information, the student does not have to pre-plan the series of events or activities. The sense of hearing provides information without any intentional effort.

The visual channel, on the other hand, only operates during waking hours. This channel is directional, and one must be actively involved in focusing visual attention on the elements of the environment. While people often refer to visual scanning as "seeing out of the corner of their eyes," the visual channel is basically a one-to-one channel, and visual attention is focused on one element at a time. For example, if a student uses a sign system for communication, it is difficult to focus on the message of an interpreter while concentrating on a test demonstration at the same time.

When a student is hearing impaired, the accuracy, scope and completeness of information received by the auditory channel are affected, depending upon the nature and severity of the hearing loss. Due to the different characteristics of the auditory and the visual channels, the visual channel cannot totally compensate for information not provided by the auditory channel. Because of their dependency upon the visual channel for communication, hearing impaired students experience visual strain and fatigue and require frequent visual breaks.

IMPACT OF HEARING LOSS UPON SOCIAL INTERACTION

For all individuals, social growth relates to developing meaningful interaction in social, cultural, recreational and organizational activities. For a hearing impaired student this interaction is often limited to superficial involvement because of the loss of contact with the

environment through the auditory channel and reliance upon alternative modes of communication. Evaluators are conscious of the frequent occurrence of social situations where the hearing impaired student is physically present but socially absent.

From the moment of birth or from the onset of the hearing loss, a hearing impaired student's primary relationships will be affected. This would include the relationships of the child with parents, siblings, and peers. The sense of hearing provides the typical channel for the communication of affection, thoughts, needs and desires. When this channel is impaired, children who are part of social situations with only hearing individuals may experience tremendous isolation and feelings of rejection. Normal routines such as mealtimes and family reunions are often painful and lonely experiences for a hearing impaired student. Social situations in the educational setting such as recess and lunchtime may also be difficult.

Many hearing impaired individuals may choose to become part of the deaf culture in order to form social, environmental and communication bonds where the impact of the hearing impairment is a common circumstance. Children of hearing impaired parents, as well as hearing parents, may choose to identify with this cultural group.

Linguistic, environmental and social factors are present at all times during the student's educational development. Consideration of all these factors provides the framework for the evaluation process.

Chapter 2

GENERAL CONSIDERATIONS IN EVALUATION

THE EVALUATION PLAN

Once a child with a suspected hearing loss is referred to the child study team, the primary function of the team is to determine the student's eligibility for special education and to develop individualized education programs for those identified as eligible. In order to determine a student's instructional needs, the child study team develops an evaluation plan in accordance with N.J.A.C. 6:28-3.4, which considers the following factors:

1. information to be obtained;
2. evaluation procedures necessary to obtain this information;
3. language(s) or method of communication to be used in the evaluation process;
4. designation of a child study team member as case manager.

Information Gathering

A review of the student's school and confidential records is completed to gather information regarding:

academic performance

behavior

attendance

medical, audiological and family history

past educational placements

The child study team then decides what additional information is needed to determine eligibility for special education, to develop meaningful goals and objectives that will improve instruction, and to assist with program and placement decisions.

Selection of Evaluation Procedures

For those children with hearing impairments newly referred to the child study team, the following six basic evaluations are included in the evaluation plan (N.J.A.C. 6:28-3):

audiological

communication

social

psychological

learning

medical

If recent audiological records are not available, the audiological evaluation is the first to be completed to ascertain the nature and degree

of sensory impairment. Based upon results of the audiological assessment, the local child study team may revise the child's evaluation plan.

The audiological evaluation is followed by the communication evaluation, since language ability is basic to all other testing. The order of the other evaluations is to be determined for each child individually. The medical evaluation is currently required for all classified students, but will not be discussed in this guide, except as it may relate to other handicapping conditions. For triennial reevaluations it is recommended that, minimally, the audiological, communication and learning evaluations be updated, in addition to any other requirements.

If specialized teams are used for an evaluation they should be consulted regarding the design of the evaluation plan.

Language/Method of Communication

The child is tested in his/her native language and primary mode of communication, using validated tests administered by trained personnel. This implies that the examiner has knowledge, skills and experience in testing hearing impaired children and can communicate using several forms of signed English or American Sign Language, if necessary, with or without an interpreter. If an interpreter is used, the examiner knows the correct protocol involved; for example, how the interpreter relays and translates information. The examiner utilizes a qualified interpreter who is able to

communicate using the sign system of the child and can effectively and comfortably interact in both formal and informal settings.

Selection and Role of Case Manager

Part of the evaluation plan includes selection of a case manager. Preference is given to that child study team member who is most knowledgeable in the area of hearing impairment and its implications. The case manager reviews the audiological assessment to determine the nature and degree of loss, the possible etiology, any recommended amplification and performance with amplification. The case manager is aware of other factors that affect the child's potential to utilize his/her residual hearing such as age of onset, age of intervention, and use of hearing aids. If additional information is required, consultation with the audiologist is recommended.

TEST SELECTION

Hearing impaired students often are tested with the same evaluation instruments as those administered to the general population. The reasons for this are varied; however, of primary consideration are the limited number of tests specially designed for the hearing impaired population. References to these specially designed tests, or to tests normed on the hearing impaired population, are the only tests included in these guidelines. Our purpose is to alert the reader to references that may not be familiar to the evaluator, rather than to specify many other tests

that are likely to be part of a battery for any student who is not hearing impaired.

The Division of Special Education does not endorse any particular tests. The tests mentioned in these guidelines are those currently in use by specialized child study teams for the evaluation of hearing impaired children in New Jersey, and by practitioners at the Gallaudet University Kendall Demonstration School and the Model Secondary School for the Deaf in Washington, D. C. Test selection is solely the responsibility of the trained professional, whose judgments are based on an understanding of the implications of hearing impairment on learning, knowledge of the individual, and the purpose of the testing.

ISSUES IN TESTING

In subsequent sections of these guidelines, discipline-specific suggestions for testing are made. The following general considerations relate to any formal testing situation:

- What is the purpose for using the instrument?

The instrument is used to gather information which will assist the child study team in designing an instructional program and in identifying an appropriate educational environment. The instrument provides information that is relevant to the student's current educational status and to transitional, career or post-school planning.

- What normative data are available for this instrument?

Most tests are not normed on a hearing impaired population; however, an examiner may choose to use such tests, developing local norms if enough students are tested over a period of time. There is some rationale for using tests normed on the general population and comparing those test results to that of a hearing impaired person when, for example, decisions regarding mainstreaming are at issue. When using tests in which normative data on hearing impaired individuals are included in the sample, caution is to be taken that such data reflect a population similar to the individual being tested.

- How long does the instrument take to administer and interpret?

In selecting tests, the examiner recognizes that many instruments will require extended time or additional sessions for administration. In addition, when interpreting results, increased time is necessary to identify which errors may be a result of language deficits.

- Does the test contain verbal or performance items?

Tests including verbal items may be used for those students who possess age appropriate linguistic skills, or when the evaluator wishes to determine the English syntax and semantic levels of the student. Tests containing verbal items assess linguistic skills and are inappropriate for most hearing impaired individuals.

- How may optimal performance be obtained during the testing sessions?

If the child uses hearing aids, they must be worn during the assessment. It is the responsibility of the evaluator to ascertain if the aids are in proper functioning condition. In this way the evaluator increases the validity of the testing.

Before a formal evaluation in which assessment instruments are used, the environment is planned to reduce visual and auditory distractions. Certain types of artificial light, sunlight coming through windows, patterns in clothing, and jewelry worn by the evaluator are just a few examples of the variables that can have a negative effect on a child's ability to attend. Auditory distractions such as voices, machines, heating and ventilation systems, fluorescent lights, footsteps in the hall, and echoes in a room can also adversely affect the child's performance.

- How is the instrument to be administered?

Unless the student understands what is being requested, the validity of the test results will be jeopardized. However, whenever test instructions are modified, the standardization of the test will be affected. The examiner determines the purpose of the test to decide which is most important.

If alternate instructions of a test may be used, the examiner uses them instead of verbal instructions. An experienced examiner may use demonstration, written language, sign language, gesture, and practice

activities to be sure instructions are understood. Even tests whose items are performance-oriented often have verbal directions which may be misunderstood by the hearing impaired individual.

- What are the effects of test modifications?

Modifying directions and providing additional time for test completion are examples of changes in test administration that will affect the standardization of a test. Providing non-verbal test directions, using gestures, written language, or sign language may give clues to the responses. For example, sign language uses many iconic representations of vocabulary items, such as labeling body parts by simply pointing to them. Explaining directions in a simpler way or providing additional examples and practice may affect results. Such modification is noted in the interpretation of test results.

The use of an interpreter changes the testing situation in several ways. Most importantly, the presence of an interpreter changes a dyadic relationship between examiner and examinee into a triadic relationship which can become quite complicated and confused.

Chapter 3

THE AUDIOLOGICAL EVALUATION

The audiological evaluation measures the response of the auditory system, documents those responses, and provides an interpretation of the findings. If dysfunction of the auditory system is observed, the dysfunction should be explained in terms of how it may affect the child's ability to hear, understand, and function both within the classroom environment and in social/familial environments.

The audiological evaluation involves measurement of the peripheral and, if necessary, the central auditory mechanism. Basically, the peripheral auditory mechanism includes the outer, middle, and inner ear. The central auditory mechanism includes the brainstem and cortex. The peripheral auditory mechanism is responsible for hearing, per se, whereas the central auditory mechanism is involved in the complex task of processing and interpreting sounds.

The outer, middle, and inner ear of the peripheral auditory system processes sound originating as acoustic energy at the external auditory canal and eventually transforms it into electrical energy within the inner ear. If the problem is in the outer or middle ear such as impacted cerumen, ruptured tympanic membrane (eardrum), fluid within the middle ear, abnormal air pressure within the middle ear, and so forth, the hearing loss is referred to as a conductive hearing loss and can usually be corrected

medically and/or surgically. If the problem originates within the inner ear, the hearing loss is referred to as a sensorineural (neurosensory or "nerve") loss, it is usually permanent and probably cannot be helped with medical or surgical intervention.

The central auditory mechanism involves processing and interpretation of complex auditory signals. The central auditory mechanism needs to be intact in order to adequately process speech and language. It is possible to find problems within the central auditory mechanism in persons with normal hearing.

Thus, the audiological evaluation involves assessment and interpretation of function of the peripheral as well as the central auditory mechanism. Interpretation of the findings, naturally, relates to the nature and severity of the hearing loss if it is a peripheral auditory dysfunction. If the findings suggest a central auditory dysfunction, the interpretation is based on the type of central auditory dysfunction and again the severity of that dysfunction.

The remainder of this chapter will focus on the specific audiometric measures used to evaluate function of the peripheral and central auditory systems. Additionally, measures used to evaluate hearing aid performance will be discussed. Interpretation of results relative to handicapping effect will also be presented.

INFORMATION PROVIDED BY THE AUDIOLOGICAL EVALUATION

Pure Tone Audiometric Measures

Pure tone threshold measures describe how well the peripheral auditory mechanism responds to various frequencies. Pure tone thresholds are measured with earphones and a bone conduction vibrator. The relationship between air and bone conduction thresholds yields information concerning whether the hearing loss is conductive (outer/middle ear) or sensorineural (inner ear) in nature. Pure tone thresholds are plotted on an audiogram which is simply a graph with frequency as the abscissa and decibel (dB) level as the ordinate.

The normal auditory system is capable of responding to frequencies ranging from 20 through 20,000 Hertz (Hz). As a frame of reference, middle C on a piano has a frequency of 256 Hz. One octave higher on the piano is 512 Hz. Most sounds which are important to hearing and understanding speech are within 250 to 3,000 or 4,000 Hz. That is, if the peripheral auditory mechanism is able to respond to frequencies from 250 to 3,000 or 4,000 Hz within the normal hearing range, the system is considered adequate for normal communication in most cases.

Clinically, the test frequencies which appear on the audiogram range from 125 through 8,000 Hz in octave intervals. That is, the typical pure tone evaluation includes frequencies 125, 250, 500, 1,000, 2,000, 4,000, and 8,000 Hz. Some evaluations include testing at 12,000 Hz.

The ordinate of the pure tone audiogram includes decibel notations typically from 0 through 110 dB or higher, in 10 dB increments. Thus, the audiogram has frequencies noted from the left to the right with 125 Hz on the left hand side of the audiogram and 8,000 Hz or 12,000 Hz on the right hand side of the audiogram. From top to bottom, dB levels are indicated with 0 at the top and 110 at the bottom.

The pure tone threshold evaluation measures how well the auditory system responds to frequencies between 125 and 12,000 Hz. Threshold is defined as the lowest dB level at which the ear responds three times at a particular frequency. A response between 0 and 20-25 dB is usually considered normal (see Audiogram #1). From 26-40 dB represents a mild hearing loss; from 41-55 dB a moderate hearing loss; from 56-70 dB a moderately severe hearing loss; from 71-90 dB a severe hearing loss and beyond 90 dB, a profound hearing loss.

In general, the lower frequencies (250 through 1,000 Hz) contain the energy of the vowel sounds. That is, the vowel sounds of our language have energy which is considered "low frequency" and typically within the 250 through 1,000 Hz range. The energy of the consonant sounds is generally concentrated above 1,000 Hz. The consonant sounds, particularly the consonants which are voiceless (produced without vibration of the vocal folds) such as the /s/, /th/, /f/ and so forth, are considered high frequency sounds. Many children with sensorineural hearing losses have high frequency losses. They will not hear consonant sounds (higher frequency) as well as vowel sounds (lower frequency). In fact, if the loss is severe

enough, they may not hear the consonants at all, even when aided. To a child with such an auditory configuration, speech might sound "mumbled" or "garbled." Consonants are the sounds which generally are considered to provide intelligibility to speech.

Air conduction testing for each ear is tested individually at each frequency using earphones. Hearing through earphones measures how well the outer, middle and inner ears function. Bone conduction testing is done using a bone vibrator, usually placed on one of the mastoid processes (bony prominences behind the ears). In essence, bone conduction testing measures the response of the inner ear while bypassing the outer and middle ears. If bone conduction responses are better than air conduction responses, the problem is likely to be in the outer or middle ear and is conductive in nature. If there is no difference between air conduction and bone conduction thresholds, the hearing loss is likely due to a problem in the inner ear, or is sensorineural in nature. Children may experience a hearing loss with components of both, and this is referred to as a mixed loss.

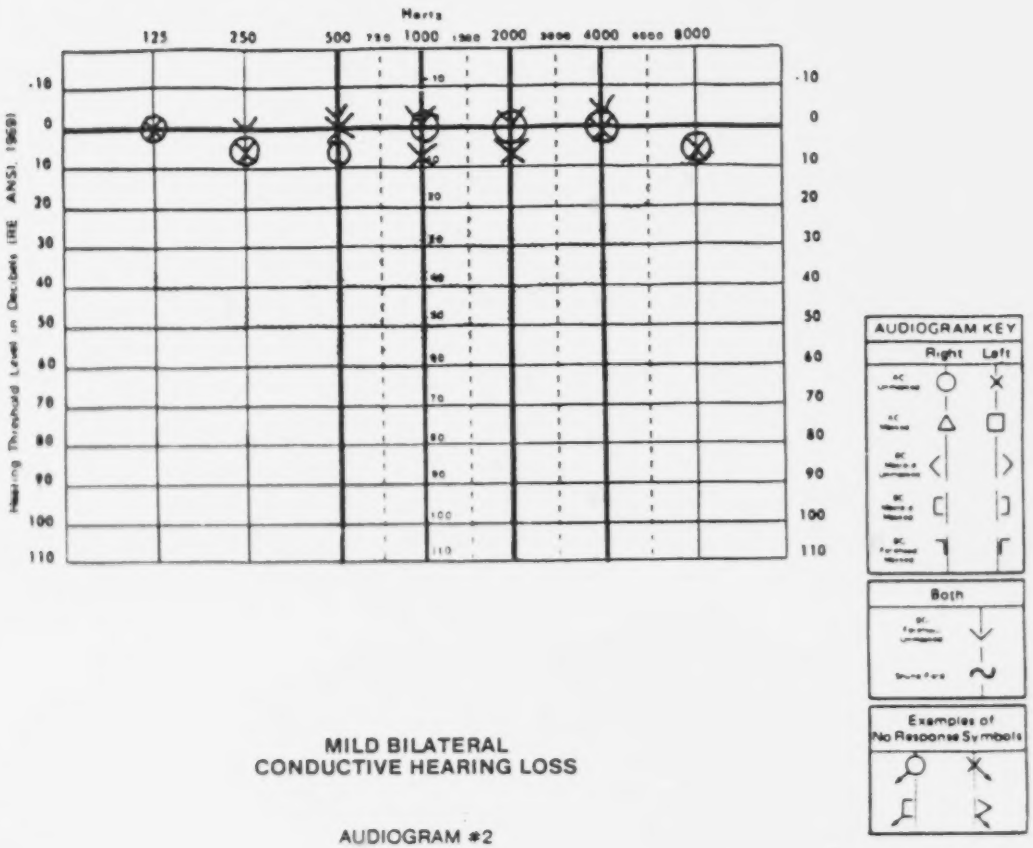
The audiogram should have a legend or key which identifies left ear and right ear, by bone conduction and by air conduction. Generally, the left ear is identified with an X or a △, the right ear with a ○ or a □, bone conduction with either > or < or a bracket (R = [, L =]) or by a tent type symbol (^). These different symbols simply refer to testing done with or without masking. Masking refers to a technique used by audiologists to prevent the better ear from influencing the performance of the poorer ear in a testing situation. If masking is necessary, the audiologist will record

the masked threshold. The audiogram illustrates how well each ear is functioning via air conduction and via bone conduction. As mentioned above, the difference between air conduction and bone conduction for a particular ear indicates to what degree a hearing loss may be sensorineural or conductive in nature. If there is a difference between air conduction and bone conduction of more than 10 dB, there is a conductive component (see Audiogram #2). If the difference between air conduction and bone conduction for a particular ear at a specific frequency is 10 dB or less, there is no significant conductive component.

The severity of the hearing loss is generally described across the test frequency range. That is, if there is a moderate hearing loss (41 to 55 dB) at all test frequencies (from 250 through 12,000 Hz) the hearing loss would be described as a flat moderate hearing loss (see Audiogram #3). If hearing at the lower frequencies is normal with a steep drop in hearing to the severe hearing loss level at the higher frequencies, the loss would be described as a precipitous high frequency hearing loss (see Audiogram #4). If the loss is sensorineural in nature (0 to 10 dB air bone gaps) the loss would be described as a high frequency sensorineural hearing loss.

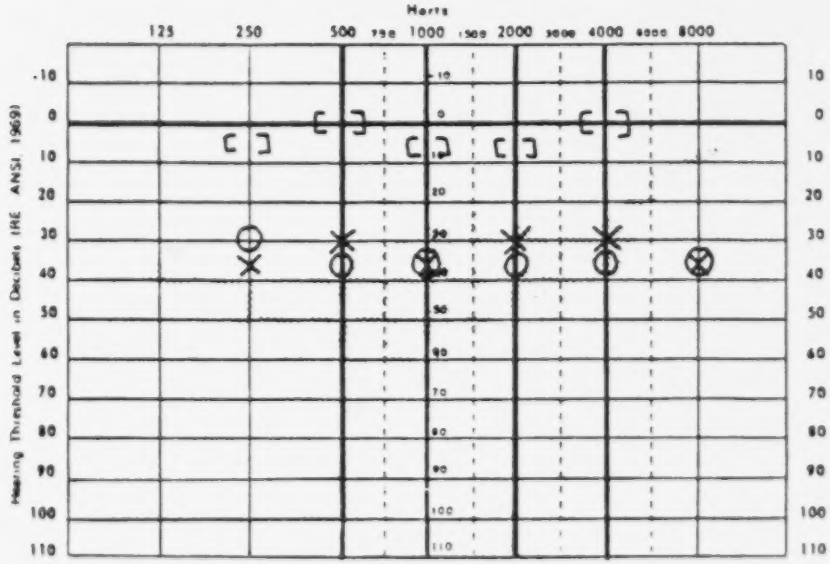
NORMAL HEARING IN EACH EAR THROUGHOUT THE TEST FREQUENCY RANGE

AUDIOGRAM #1



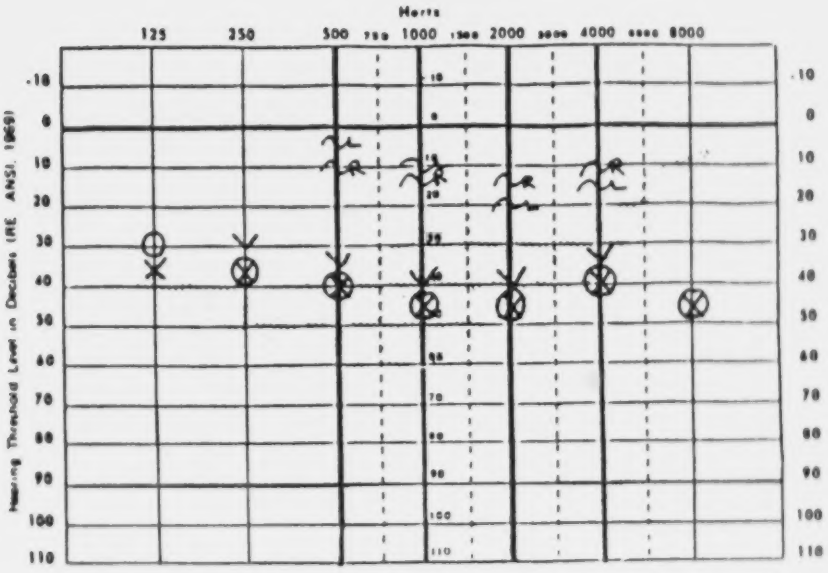
MILD BILATERAL CONDUCTIVE HEARING LOSS

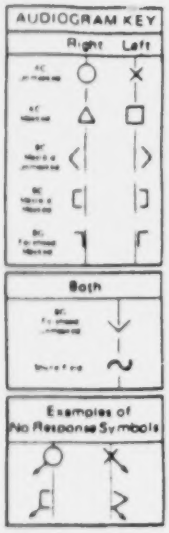
AUDIOGRAM #2



MILD TO MODERATE BILATERAL FLAT SENSORINEURAL HEARING LOSS

AUDIOGRAM #3





AIDED RIGHT EAR

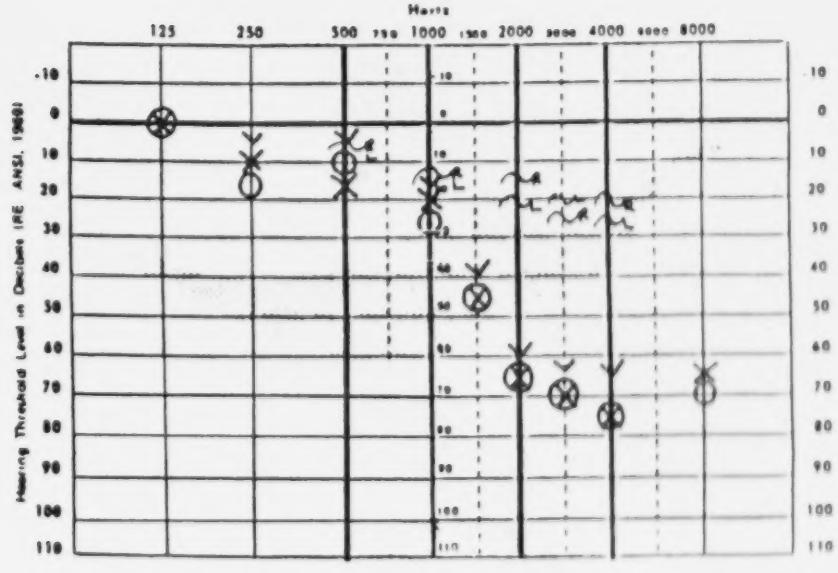
BRAND ____, MODEL ____.

SERIAL # _____

SETTINGS:

PRECIPITOUS BILATERAL HIGH FREQUENCY SENSORINEURAL HEARING LOSS

AUDIOGRAM #4



AIDED LEFT EAR

BRAND ____, MODEL ____.

SERIAL # _____

SETTINGS:

WARBLED TONES (40%)

Tympanometry/Reflex Testing

Tympanometry/reflex testing is a measure which assesses eardrum mobility and thereby gives us information about the integrity of the middle ear cavity and the responsiveness of the middle ear musculature. It is not a measure of hearing.

Different tympanograms suggest either normal middle ear function or suggest the presence of certain pathologies which may exist within the middle ear system. If an abnormal tympanogram is observed, the child should be referred for a medical evaluation. The presence or absence of reflexes can provide the audiologist with information about a possible sensorineural component.

Speech Audiometry

Speech stimuli are used to measure the reception thresholds for speech, comfortable loudness level for speech, uncomfortable loudness level for speech, and discrimination ability for speech. Speech audiometry is conducted with stimuli presented via earphones.

Speech Reception Thresholds (SRT) reflect how quiet speech has to be in order for the child to barely perceive the stimuli presented. Typically, two syllable words are used (baseball, hotdog, toothbrush and so forth) to measure the SRT. The Speech Reception Thresholds should correspond to pure

tone thresholds obtained via earphones for 500 and 1,000 Hz. The frequency spectrum of vowels is at the lower end of the speech frequency range (500 and 1,000 Hz). Thus, if hearing for 500 and 1,000 Hz is normal, hearing for two syllable words should be normal, since identification of the two syllable words is basically a vowel identification task. If the child is unable to appropriately respond to SRT stimuli, a Speech Detection Threshold (SDT) may be obtained in which the response pattern need not be verbal.

Hearing sensitivity for speech is described in the same way pure tone thresholds are described relative to severity. That is, if the Speech Reception Threshold is between 0 and 25 dB, hearing for speech is generally considered "normal." If hearing for speech is between 26 and 40 dB, it is considered a mild hearing loss for speech, between 41 and 55 dB is in the moderate hearing loss range for speech, and so forth.

Comfortable loudness levels and uncomfortable loudness levels for speech are very important measures, particularly if a hearing aid is being recommended. Normal conversational speech to the listener with normal hearing is at approximately 45-50 dB Hearing Threshold Level (HTL). If a child has a 40 dB hearing loss, we cannot assume that the child's most comfortable listening level (MCL) will be 90 dB (40 dB above the normal comfortable listening level of 50 dB). Frequently, with sensorineural hearing loss, there is an abnormal growth of loudness referred to as recruitment. With recruitment, a child with a 40 dB hearing loss may feel that speech is comfortable at 65 dB or 75 dB HTL. This information is critical in terms of providing appropriate gain when selecting a hearing

aid. Similarly, uncomfortable loudness level is not linear with respect to sensorineural loss. That is, a listener with normal hearing may designate 100 dB HTL as very loud, while a child with a 40 dB hearing loss may feel that 85 dB HTL is too loud. Again, this measure is critical when designating a maximum power output or "ceiling" for the hearing aid, and when recommending an appropriate acoustic environment with consideration of the child's auditory functioning.

Discrimination ability for speech is generally measured using one syllable, phonetically balanced words. The words are presented at a comfortable listening level. The child repeats, or in some other way identifies, the words that are presented and a percentage score is obtained. The discrimination score does not necessarily indicate how well a child is functioning relative to discrimination in his normal listening environment. However, differences between ears are frequently observed. This information becomes critical when discussing the effect of the hearing loss on communication, particularly in the classroom environment. Discrimination ability is generally reported in percentages with some indication whether these results are considered to be "excellent," "good," "fair," or "poor."

Hearing Aid Evaluation

The hearing aid evaluation is reserved for children who have a peripheral hearing loss which is handicapping to the extent that they are unable to function adequately without the assistance of hearing aids. Based on hearing sensitivity for pure tones and for speech, a determination is made

concerning whether hearing aids may be beneficial and/or necessary. All speech testing thus far has been done under earphones. The hearing aid evaluation is done by presenting stimuli into the sound booth via loudspeakers.

Hearing sensitivity with and without hearing aids is measured in the sound booth via loudspeakers and is referred to as sound field testing. Typically, unaided thresholds are obtained for warbled tones or narrow band noise across the test frequency range. Hearing sensitivity for speech (SRT/SDT) as well as discrimination ability for speech is measured via loudspeakers. Most comfortable loudness and threshold of discomfort may also be measured in the sound field.

During the hearing aid evaluation, careful attention must be paid to the child's position with respect to the loudspeakers as well as to all of the settings of the hearing aids. Most hearing aids have frequency response controls, maximum power output controls, and various other means by which the electroacoustical output of the hearing aid can be modified. The specific settings need to be documented in the report for future comparisons. In addition, the validity of the hearing aid evaluation can also be influenced by the child's position in the testing room.

It is critical that the audiological report describe how well the child should be expected to perform in the aided condition within the classroom environment. Simply fitting a child with hearing aids will not guarantee normal auditory response. Hearing aids, unfortunately, cannot be likened to

eyeglasses. Unlike the visually impaired, hearing aids cannot restore "normal hearing" as eyeglasses frequently are able to restore "normal vision." The hearing aid is nothing more than a low fidelity amplifier. It consists of a microphone, amplifier, receiver and power supply. The instrument has relatively poor reproduction capabilities. Thus, we cannot guarantee improved discrimination ability with hearing aids. The hearing aid will most certainly make speech louder, but unfortunately not always clearer.

Central Auditory Function

Central auditory processing measures include a number of tests which measure how well the central auditory mechanism interprets and processes linguistic information. The tests evaluate how well each ear processes the information as well as how the ears work together to process linguistic input.

Central auditory processing tests may evaluate selective attention, auditory closure skills, auditory memory, auditory sequencing, sound-symbol association, and temporal auditory integration. Deficiencies in these areas often will have a significant impact on a child's ability to learn within the classroom environment. Interpretation of these deficiencies and recommendations involving ways in which the handicapping effect of these deficiencies can be reduced within the classroom environment are outlined in the audiological report.

Although information about a hearing impaired child's ability in this area would be valuable, it is frequently not possible to conduct these tests due to the highly verbal requirement inherent in the testing procedures. Some children who fail the audiometric screening and are referred for further audiological testing may have intact peripheral auditory mechanisms, but present central auditory processing problems which are educationally significant.

EXPERTISE OF THE EXAMINER

An audiological assessment should be conducted only by an audiologist in an approved audiological testing facility. The State of New Jersey licenses audiologists. If the audiologist is located outside the State of New Jersey, his/her professional qualifications should be comparable to those required by New Jersey licensure. The New Jersey Department of Health has identified and approved audiology centers in which audiologists possess experience and expertise regarding the educational needs of children with hearing loss. These centers also have state-of-the-art equipment.

An audiological evaluation, which is administered to assess a child's ability to function educationally, requires an audiologist who is familiar with the various modes of communication used by hearing impaired children and their families. The audiologist must possess communication skills that enable him/her to establish a rapport with the child. Assessment of very young children or less mature, distractible, hyperactive, mentally retarded or generally difficult to test children requires an audiologist experienced with specialized techniques developed to work with these youngsters.

THE REPORT

Generally, an audiological report for school-aged children includes information that will help the child study team understand the child's auditory functional ability, and the child's needs in the areas of auditory remediation and acoustic classroom management, thereby providing input for the individualized education program.

The report includes the following items, although this is not an exhaustive list:

1. A statement as to the child's native language and primary mode of communication within the home and with the audiologist during the assessment.

2. A statement as to the etiology of the hearing impairment, if known, as well as the type and degree of the hearing loss and the age of onset.

3. A statement regarding the reliability of the audiological evaluation.

4. Results of all the tests which were administered, including the audiogram, measures such as the SRT or SDT, the MCL, and speech discrimination testing results when administered.

5. Interpretation of these results with implications for functional auditory ability, including statements about the child's ability to

localize sound and to discriminate speech. An indication of the levels at which speech was presented during testing, and the specific word list used. These should be reported for both the performance when the child was not aided by amplification, and for the performance when aided and in the sound field condition.

6. The various conditions under which the testing was administered.

7. Identification of, and various settings for all amplification systems used, including the child's own hearing aid(s).

8. Information about the suitability of particular hearing aids in the educational setting, and a statement about the performance of the child's own hearing aid(s) when applicable.

9. A description of how well the child performs in the aided condition and how well he/she may be expected to perform within the classroom environment in the aided condition.

10. A general statement about the child's speech intelligibility.

11. Other information about the child's ability to process auditory stimuli in a school environment that may be helpful to the school personnel in planning and providing a meaningful educational program.

12. Recommendations for future audiological testing.

Chapter 4

COMMUNICATION EVALUATION

INFORMATION PROVIDED BY THIS EVALUATION

The speech-language assessment provides information about the child's ability to communicate - to understand and use language. This evaluation addresses the following specific areas:

native language
primary mode of communication
oral mechanism
articulation
voice and fluency
receptive and expressive language

The purpose of this evaluation is twofold: to determine the child's native language or primary mode of communication and to assess competencies in the comprehension and production of standard English. Native language is defined as, "the language or mode of communication normally used by a person with a limited ability to speak or understand the English language." (N.J.A.C. 6:28-1.3). Hearing loss brings with it a concomitant loss in language comprehension and expression; therefore, prior to testing the examiner determines if a language other than standard English is the native language. In the case of hearing impairment, the further issue of

communication mode is established.

Since all educational evaluations have as their ultimate goal educational programming, the information gathered in the speech-language assessment indicates how the child understands and uses language orally and/or through signing in order to benefit from educational programming. The child's communicative competencies are crucial for determining the least restrictive environment, including mainstreaming, full or part-time special education programs, and day or residential programs. The determination of the need for related services, as well as curriculum modification, are also outcomes of this evaluation.

EXPERTISE OF THE EXAMINER

In order to identify the primary mode of communication and to determine the native language of the child, this examiner is proficient in the same communication mode as the individual to be tested. This includes knowledge of manual communication - several systems of signing English or American Sign Language, if appropriate. Other competencies include the ability to select, administer and analyze both formal and informal assessment instruments, considering the linguistic deprivation due to impaired hearing. The examiner is also able to modify tests in order to obtain optimal performance, while noting the effects that such modification will have when reporting results of standardized measures.

TYPES OF TESTING AND STRATEGIES

Native Language and Primary Mode of Communication

Since all evaluations for educational purposes must be provided in the child's native language and primary mode of communication, it is essential that these be established before any discipline-specific evaluations are administered. The native language may be English (using speech, gesture, sign, fingerspelling), American Sign Language (which has its own vocabulary and grammatical rules) or possibly another language, such as Spanish.

Along with establishing native language, the evaluator determines the most effective communication modality. This is the mode of communication in which the child best understands and expresses him or herself. The normal modes of communication for hearing children are acoustic (listening) and oral (speaking). For the hearing impaired individual, visual (speechreading, reading) and manual (sign systems, writing) modes often support, replace, or compensate for limited hearing and speech. The examiner may wish to present a series of instructions or alternate forms of a test in a variety of communication modes. Speech may be used first without, then with the lip visibility to determine auditory and speech-reading comprehension. If the child signs, the questions may be presented manually, and then, if the child reads, in written form. Once the most effective mode of communication is established, the remainder of the testing should be presented in this modality.

Oral Mechanism

An examination of the oral mechanism assesses the structure and function of the articulators to ascertain if there are contributing factors, other than hearing impairment, that influence the child's ability to produce speech sounds. This examination is no different from that of a hearing child, since the structure of the speech mechanism is no more or less intact than that of the hearing population. The examiner is looking for an intact palate and adequate dental structure, as well as the functional movement of the soft palate, lips and tongue.

Articulation

Most formal tests of articulation developed for the hearing population may be used with hearing impaired children, as long as the examiner modifies the test to accommodate any difficulties that may be presented by the child's limited vocabulary. However, there are specially developed tests for young deaf children, such as the Ling Phonetic Level Speech Evaluation and the Phonologic Level Speech Evaluation (1976) that are widely used. Aside from the identification of additions, omissions, or distortions of phonemes in nonsense syllables and in words, the evaluator notes the child's ability to produce a series of consonants and vowels rapidly enough for conversational speech. General intelligibility, based on a sample of connected, preferably spontaneous speech, is also assessed. If signing is the primary mode of communication, the articulation of letters and signs is part of the assessment.

The nature and severity of the hearing loss results in a faulty auditory feedback system, and the child may not be accurately producing combinations of vowel and consonant sounds. For example, many hearing impaired children exhibit a loss in the high frequencies which may affect their production of sibilant sounds. The examiner interprets the results of articulation testing in light of the audiological evaluation to plan remedial programs in speech instruction.

Voice and Fluency

Through informal methods, such as the language samples used to test articulation, a determination may be made about voice characteristics of the hearing impaired child. The examiner determines whether or not the child uses voice in communication, spontaneously or with prompting. If voice is used, some atypical characteristics of voice that may be evidenced are: inappropriate pitch, volume, rhythm or rate, inadequate breath control, and hypernasal or denasal voice quality.

Receptive and Expressive Language

This broad area of language comprehension and expression is the most difficult to test, for reasons already apparent, yet it is the most crucial domain for all learning. It is the area primarily affected by the hearing loss, and the one in which most care should be taken to mitigate the effects of that loss. Information about language ability will be acquired by other

disciplines also, such as the learning and psychological evaluations. The specific areas in which information is obtained are: 1) child's comprehension of auditory stimuli; 2) vocabulary; 3) knowledge and use of syntactic and morphological rules; and 4) pragmatic use of language in the environment, including the use of idiomatic language.

Although there are formal tests which provide some information in these areas, language sampling is the preferred method of obtaining the most accurate picture of the child's language functioning. In this procedure, samples of the child's natural language are collected in a variety of settings over time and then assessed according to semantic, syntactic and pragmatic developmental models. Such models useful for hearing impaired children are those proposed by Kretschmer and Kretschmer (1978), and Bloom and Lahey (1978). The examiner recognizes that when elicited language samples are used instead of natural language samples, results will be affected by the stimuli presented.

When formal tests are used, the examiner always considers the purpose of the tests, and the norms on which the tests were standardized. Tests normed on the hearing impaired population will give information about how the child compares to other hearing impaired children. These tests are also often designed to reduce the effects of the hearing loss in administration. For example, test items are not presented orally, and alternate methods of administration are acceptable.

Some tests normed on the hearing impaired population include the following:

Test of Auditory Comprehension (1979), assesses a continuum of auditory functioning from gross environmental sound discrimination to comprehension of words, questions, commands and stories.

Test of Receptive Language Ability (1981), Test of Expressive Language Ability (1981), and the Test of Syntactic Abilities (1978) all provide information about grammatical forms and syntax.

Grammatical Analysis of Elicited Language (1983), evaluates the structure of spoken or signed English.

It is beyond the scope of these guidelines to describe in detail the nature, advantages and disadvantages of these tests; however, the bibliography at the end of this monograph includes citations for such information.

In addition to formal and informal tests, interaction scales and observations of the child in the classroom setting can provide valuable information regarding the child's use of residual hearing, speechreading, and signing in understanding language and in responding appropriately within the environment. The skilled observer is looking for such things as the child's ability to watch the speaker and to respond appropriately to questions, social interactions with peers, classroom characteristics, placement of the child in the room, the use of personal or classroom amplification systems and the use of interpreting services and augmentative communication systems.

REFERENCES

Tests used to assess language comprehension:

Bunch, G. (1981). Test of Receptive Language Ability. Toronto, Ontario: G.B. Services.

Clark, T.C. and S. Watkins. (1978). The SKI-HI Language Development Scale (Assessment of Language Skills for Hearing Impaired Children). Logan, Utah: Project SKI-HI Outreach.

Engen, E. and T. Engen. (1983). Rhode Island Test of Language Structure. Baltimore, Maryland: University Park Press.

Layton, T.L. and D.W. Holmes. (1985). Carolina Picture Vocabulary Test (receptive sign vocabulary test, deaf normed). Tulsa, Oklahoma: Modern Education Corporation.

Moog, J.S., V.J. Kozal and A.E. Geers. (1983). Grammatical Analysis of Elicited Language (GAEL) - Pre-Sentence Level, Simple Sentence Level, Complex Sentence Level. St. Louis, Missouri: Central Institute for the Deaf.

Quigley, S.P., M.W. Steinkamp, D.J. Power, and B.W. Jones. (1978). Test of Syntactic Abilities. Beaverton, Oregon: Dormac, Inc.

Test of Auditory Comprehension. (1979). N. Hollywood, California: Foreworks.

Tests used to assess language production:

Bunch, G. (1981). Test of Expressive Language Ability. Toronto, Ontario: G.B. Services.

Clark, T.C. and S. Watkins. (1978). The SKI-HI Language Development Scale (Assessment of Language Skills for Hearing Impaired Children). Logan, Utah: Project SKI-HI Outreach.

Gardner, M.F. (1979). Expressive One-Word Picture Vocabulary Test. San Francisco, California: Children's Hospital of San Francisco.

Kretschmer, R. & L.W. Kretschmer. (1978). "Richard Kretschmer Spontaneous Language Analysis." In Language Development and Intervention with the Hearing Impaired. Baltimore, Maryland: University Park Press.

Ling, D. (1976). Phonetic Level Speech Evaluation. Washington, D.C.: Alexander Graham Bell Assoc.

Ling, D. (1976). Phonologic Level Speech Evaluation. Washington, D.C. : Alexander Graham Bell Assoc.

Moog, J.S., V.J. Kozal and A.E. Geers. (1983). Grammatical Analysis of Elicited Language - (See tests used to assess language comprehension.)

White, Jr., A.H. (1974). Maryland Syntax Evaluation Instrument. Sanger, Texas: Support Systems for the Deaf.

Young, E. (1981). Patterned Elicited Syntax Screening Test. Tucson, Arizona: Communication Skill Builders.

Chapter 5

SOCIAL EVALUATION

Meaningful interaction is critical for all individuals. How we relate to our inner selves, to each other and to various educational, cultural, social and community organizations is an ongoing process throughout a lifespan. A school social worker responsible for the social assessment of a hearing impaired student must possess a knowledge of deafness, its ramifications upon communication and therefore upon interaction patterns.

The role of the school social worker is multifaceted. He/she possesses a knowledge of this invisible disability and its continuous internal and external impact upon the hearing impaired student, the family and community. The school social worker also has clinical expertise in obtaining and assessing relevant information which will provide diagnostic data leading to beneficial intervention strategies. These strategies focus not only on the student in the educational setting but also in the context of his/her entire life, including home, community, intrapersonal and interpersonal relationships.

INFORMATION PROVIDED BY THIS EVALUATION

The social assessment is the comprehensive study of the hearing impaired student which reflects the multiple aspects of his/her life experiences.

The parents or primary caretakers, the student, other family members and members of the community serve as the primary sources of information for the social worker. This study includes developmental and medical histories, assessment of social functioning as it relates to personality traits, adaptive behaviors, peer and adult interactions and community involvement. Major components include family history, medical and developmental information, communication, educational background, community/social experiences, adaptive behavior and parental long and short term goals. While similar to social histories for other handicapping conditions, the information within each of the components is unique to the hearing impaired individual. The following outline identifies within each major section specific areas which are addressed:

Family History

A. Family constellation - (ages, occupation and education)

- Parents/primary caretaker
- Siblings
- Significant others
- Other family members who are hearing impaired

B. Family dynamics

- Parental mode of communication with the hearing impaired student at home and in public

- Siblings' mode of communication with the hearing impaired student at home and in public
- Hearing impaired student's mode of communication with the parents and siblings at home and in public
- Frequency and level of communication among family members
- Frequency and level of frustration among family members regarding communication
- Family members' view of the hearing impairment and of the hearing impaired student as a family member
- Hearing impaired student's view of himself within the family

C. Family Interaction

- Impact of the hearing impairment upon family life
- Relational patterns observed (i.e., the frequency and context of situations where communication is initiated or avoided by family members and/or the hearing impaired student)
- Amount of time the hearing impaired student spends alone
- Grieving process of immediate and extended family members in the past and present
- Familial reinforcers
- Familial rules and discipline procedures
- Familial non-verbal communiques

Developmental History

A. Birth history

B. Hearing loss

- Etiology
- Type
- Age of onset
- Age of diagnosis
- Residual hearing (with and without amplification)
- Age when amplification was introduced, if applicable

C. Developmental Milestones

- Crawling
- Walking
- Toileting
- Speech (if appropriate)

Medical Information

(complementary to the medical history prepared by the school nurse)

A. Medical history to date

- Allergies
- Hospitalization(s)
- Surgery
- Current medication
- Other

B. Presence of other handicapping conditions

C. History of otitis media, if known

D. Ophthalmological information

- Dates of reports
- Summary of findings

E. Annual audiological information

- Dates of reports
- Summary of findings

F. Evidence of progressive loss

Communication

A. Effectiveness of amplification

- Personal aid
- Group amplification system

B. Current language ability

- Expressive
- Receptive

C. Assistive listening or communication devices

- Home
- School

(Include auditory training system, TDD, television decoder, telephone amplifier, fire alarm system, personal computer, wake-up alarm, door bell, hearing ear dog).

Educational History

A. Previous placements to include early intervention, preschool, and all grade school placements

B. Communication philosophy of each placement

C. Mainstreaming experiences past and present

D. Related services utilized past and present (Include interpreters, tutor notetakers, FM systems.)

Community/Social Experiences

A. Community resources/affiliations with organizations for the hearing impaired

B. Social interests/hobbies
   - within the deaf community
   - within the hearing community

C. Peer relationships outside the family unit

D. Family contact with other hearing impaired individuals and/or families with hearing impaired children

Adaptive Behavior

A. Student's image of self
   - Self-esteem
   - Feelings related to the hearing impairment
   - Positive and negative experiences in family, school and community

B. Locus of control
   - Internal
   - External

C. Behavior responses to

- Change
- Stress
- Communication barriers in social, educational and familial environments

D. Independent living skills

- Self-care
- Emergency situation skills
- Use of free time
- Study skills

E. Cultural preference

- Hearing community
- Hearing impaired community

Parental Goals for Student (short and long term)

A. Academic

B. Social

C. Vocational

D. Post-secondary

E. Transition

EXPERTISE OF EXAMINER

A school social worker responsible for the social assessment of a hearing impaired student has the expressive and receptive language skills to communicate with the hearing impaired child and their parents and/or primary caretakers with ease. An understanding of the various sign language systems is helpful in order for the school social worker to obtain the data from parents who are also hearing impaired, and from the hearing impaired student. If an interpreter is used during the interview, a social worker knows how to locate and identify a qualified interpreter who can effectively and comfortably interact in both formal and informal settings. A social worker also knows the correct protocol involved in using an interpreter and is aware of how an interpreter relays questions and translates information.

The primary method for collecting relevant data is the interview. A social worker who is interviewing oral deaf adults must be familiar with the speech of hearing impaired individuals to prevent misunderstanding and repetitious questioning. Familiarity with the deaf culture, its traditions and value system provides a framework in which to interpret the family dynamics and the community experiences for a family when the hearing impaired members have chosen to be part of this culture. Skills in observing and interpreting non-verbal communiques, such as facial expressions, body language, and gestures are essential for classroom and home observation.

An expertise in assessing the ramifications of communication difficulties in all settings of the hearing impaired student's life is critical. A school social worker is able to discern when the hearing impaired student is physically present and yet mentally absent because there is no communication between the individuals involved. The school social worker is responsible for developing intervention strategies which will effectively address the communication needs and interaction patterns in the school, home and community.

Knowledge of local, state and national resources available for hearing impaired individuals helps to simplify the evaluation planning process and the development and implementation of the IEP. The social worker is familiar with the continuum of educational services available to hearing impaired students, including early intervention programs, specialized elementary and secondary programs within local public school districts, sending-receiving relationships among public school districts, approved private schools for the handicapped (including those for the hearing impaired), and any state school for the hearing impaired.

Besides the educational options from birth through age 21, the school social worker is familiar with transition plans and opportunities for hearing impaired students after graduation. These include vocational assessment and career opportunities, adult schools, vocational and technical schools, as well as local and out-of-state colleges and universities. Transition plans are developed for students who do not need specialized post-secondary programs for the hearing impaired but do need support services of an interpreter and/or notetaker in a mainstream setting.

Knowledge of intra-state and inter-state services and agreements facilitates the hearing impaired student's transition from school to work and from school into the community. These include communication information (interpreter referral agencies, assistive listening devices) housing information, social information (clubs for the hearing impaired, religious organizations, parent/ support organizations), medical information (hospitals, physicians who have telecommunication devices or expertise in working with the hearing impaired) and travel information (public transportation systems) and emergency/crisis intervention centers (deaf contact hotlines, mental health centers).

STRATEGIES

Although a home visit is not mandated as the site of the parent interview, the student's home or current residence is the ideal setting to gather data for the social assessment. The natural environment makes it easier for the social worker to observe and assess the communication modalities and the interaction between the hearing impaired child and parents, siblings and any significant others.

At the beginning of the interview and/or observation, it is important to articulate the reason why the social assessment is being conducted. A brief outline of the kinds of information to be discussed before specific questioning begins, is helpful. Whenever possible, reports are reviewed prior to the visit so that questions are formulated as they specifically relate to past, present and future issues.

Parents and/or primary caretakers often find it difficult to repeat the same details of medical, educational and social histories for each evaluator involved in a comprehensive evaluation process. Familiarity with the history of the hearing impaired student facilitates rapport. Questions can be carefully phrased referencing the past, thereby eliminating the burden on the parent to remember all the specifics from the onset or diagnosis of the hearing impairment. If using an interpreter, a list of all questions is provided prior to the interview so that vocabulary might be reviewed. The physical setting is arranged in order to utilize the interpreter effectively for questions and answers.

The school social worker observes and interacts with the child in his current educational environment as well as in his present living situation. Behavior patterns, interaction with peers and adults, and modes of expressive and receptive communication in school are assessed as well. The use of video equipment may also aid in identifying the communication skills and non-verbal communiques between the hearing impaired student and peers.

FORMAL INSTRUMENTS

Few instruments are designed for a social assessment of hearing impaired students. However, a school social worker will find it helpful to be familiar with a variety of behavioral rating questionnaires or scales as a point of reference. One such rating scale that has been designed for the hearing impaired is the Meadow-Kendall Social-Emotional Assessment Inventories (1983). These inventories provide information regarding the

emotional developmental stages of hearing impaired students. They will assist social workers in determining what behaviors are typical for hearing impaired students at a specific chronological time period.

The Vineland Adaptive Behavior Scales (1985) provide general assessment information regarding adaptive behavior. These scales contain supplementary group norms for the hearing impaired and may be useful for determining strengths and weaknesses in the areas of communication, socialization, motor skills and daily living skills. They are also useful for engaging parents who find it difficult to be interviewed.

REPORT

The data collected by the social worker are organized and filtered into succinct, factual, clear and relevant statements. The report includes: 1) the dates of reports reviewed or consulted for historical information; 2) excerpts from the content of these reports; 3) summaries of interviews, observations, and interactions conducted; 4) information on the communication modality used by all parties contributing to the report; 5) summaries of psycho-social assessments and clinical impressions; and 6) intervention strategies and a plan of action for implementation. The focus must be on the educational relevance of these components, stressing the relationship between school, family and community factors, as well as the student's academic and behavioral functioning.

The compiled data are written in narrative form, delineating each category of information separately as outlined earlier. Headings are clear so that information can easily be located.

Any critical data are to be highlighted for expedient identification (i.e. preferred mode of expressive communication, personal amplification system).

RELEVANCE OF THE SOCIAL ASSESSMENT

The social assessment should provide answers to the following questions for the child study team and the parents:

1. What adaptive skills does the hearing impaired student exhibit at home and at school?

2. Does a skill acquired in either setting transfer to the other?

3. Is the same communication system used consistently in both environments? If not, how is the hearing impaired student coping with inconsistencies?

4. What is the communication philosophy that the family prefers for the educational placement? Is this consistent with the child study team's recommendations? If not, what strategies are needed to reach agreement?

5. What are the goals the parent has for the hearing impaired student?

6. What are the goals the school has for the hearing impaired student?

7. When appropriate, what goals does the hearing impaired student have for himself/herself?

8. Are the goals for each compatible? If not, why?

9. What intervention strategies might be needed in the school and family systems in order for these goals to be met?

10. What are the social components to be considered when planning the educational program for the hearing impaired student?

11. What socioeconomic and/or cultural factors should be addressed in an intervention plan (i.e., purchasing of hearing aids for a student whose family is experiencing economic difficulties)?

CHAPTER 6

PSYCHOLOGICAL EVALUATION

For the psychologist, assessment of a student with impaired hearing requires a review of the assumptions which underlie psychological testing. Does the use of standardized procedures assure the validity of the test results? Have children with impaired hearing been exposed to experiences allowing for acculturation to occur in a way comparable to the typical child? How valid are the conclusions we draw about future performance based upon current assessment?

One major problem frequently encountered with handicapped children is the means and clarity of the child's communication to the examiner. For the hearing impaired child, this problem is further compounded by the difficulties associated with the examiner's communication to the child. The examiner's ability to establish rapport, communicate instructions, and correctly record and interpret the responses of the child is absolutely essential if the assessment is to yield useful information.

In the United States, one generally assumes an understanding of English, and one communicates with the subject in ordinary idiomatic American English. In fact, most psychological tests have standardized instructions phrased in English, sometimes with complicated syntax and questionable usage. Although many hearing impaired people are quite competent in English, many are not. We should never assume English competence.

For the hearing impaired student, any number of educational and familial backgrounds are possible, and one can make no assumptions about the student's exposure to English or to sign language. Many hearing impaired students have been educated in the oral method and have been prohibited from signing, at least for part of their lifetime. Others have been educated in programs which use a variety of different sign systems, some of which are English-based. Many have developed competency in American Sign Language (ASL) and many have not.

For sensory-impaired children, the method by which information is received, processed and stored has been profoundly affected. Hearing impaired children depend greatly, if not totally, upon the visual channel. It is highly likely that conceptualization and all of the processes associated with it have been affected in a fundamental way.

Additionally, the abundance of information and experiences available through the auditory channel, from television, radio or the environment are not available to hearing impaired children. As a result, these children experience a kind of deprivation which can be ameliorated to some degree by modifications to the environment. Closed-captioned television, telecommunication devices for the deaf, hearing aids and interpreting services are a few examples.

Many hearing impaired individuals also choose to affiliate with a deaf community, with its social clubs, sports activities, religious activities, etc. This community provides many hearing impaired individuals with an

environment in which they can associate comfortably. The cultural characteristics of the deaf community are evidenced in styles, manners, and customs, which become an integral part of their personalities.

INFORMATION PROVIDED BY THIS EVALUATION

The psychological assessment of a pupil includes an appraisal of the pupil's status in each of the following areas: visual-motor integration, cognition and intelligence, adaptive behavior and socio-emotional development.

Many etiologies which cause hearing impairment may also result in other physical problems affecting visual-motor development. Balance and equilibrium are closely associated with hearing. The semi-circular canals, which are the body's organs for balance, are located in the inner ear and communicate with the brain via the auditory nerve. Problems with the balance and equilibrium are frequently associated with hearing loss. Visual-motor integration is of particular concern for the child who relies upon sign systems for communication.

The primary issue in cognition and intelligence testing of hearing impaired children is the difficulty in distinguishing between the problems associated with language facility and those associated with intelligence. However, insight into a child's internal strategies for acquiring, processing and storing information is particularly important for the child who relies upon vision for communication.

Appraisal of adaptive behavior can provide information regarding a student's ability to cope with the demands of the environment. For hearing impaired students, this appraisal includes information regarding strategies used to monitor the environment and to accomplish tasks for which we generally rely upon our hearing (i.e., waking up). This appraisal also includes information about communicative flexibility; that is, the ability to select different communication strategies for different situations.

The social-emotional appraisal looks at the student's knowledge about social customs and habits, experience in putting such knowledge to use, variety of social and interpersonal relationships, and overall attitudes and motivations in this area.

From birth to adulthood, hearing impaired children must overcome barriers to socio-emotional development. Infants are stimulated by sound in general, and by the voice in particular. As a result, there may be difficulty in establishing bonding. Without intervention, the hearing impaired child will have fewer meaningful interactions with others and will be forced to depend upon his parents and upon social systems which may not understand his needs. Isolation in the family, in school and in the community can be devastating to a hearing impaired child's emotional and social adjustment.

EXPERTISE OF THE EXAMINER

In addition to a thorough knowledge of testing measures and techniques, the psychologist understands how a hearing impaired child's linguistic and

experiential differences might influence test results. Among hearing impaired persons, there is a great diversity in the forms of sign language used as well as a variability in expressive and receptive skills. Ideally, the psychologist is skilled in a variety of sign systems. If an interpreter is used, the psychologist must be certain of the interpreter's skill in the language and mode of communication used by the student and familiar with the protocols used in interpreting situations. Many hearing impaired students have some skill in several communication modes and are capable of adapting their language to the situation; however, such adaptation may take its toll in spontaneity and may result in tension, frustration and misunderstanding. Language influences the assessment process more than almost any other variable, and the more experience the psychologist has in working with hearing impaired students, the greater is the sensitivity to the manifestations of these language-related factors.

The psychologist is familiar with the deaf community since this community plays such a large part in the lives of many hearing impaired people. A psychologist with a sophisticated knowledge of the community and its cultural manifestations can provide a relevant psychological assessment of a prelinguistic deaf student. Cultural differences may even be involved in the basic elements of the testing situation including the deaf student's expectations of assessment, the proper situations for discussing personal matters, the role expectations for interacting with hearing people, and the accepted way to behave when communication is unclear.

ASSESSMENT OF INTELLIGENCE

Psychological testing, in particular intelligence testing, depends, in part, on a set of assumptions which might be described as "average expectable environment." Specifically, test subjects are assumed to have had relatively equal access to information within their environments. They do not attend to learning or retain information equally, however. These individual differences in learning from the environment are assumed to be based on differences in intellectual functioning, not on differences in the environment. This assumption of an average expectable environment is inappropriate when the test subject is hearing impaired. The language, educational, and even discipline experiences of hearing impaired students are remarkably different from the typical population upon which intelligence and other tests are normed.

Because of the interdependence of language and cognition, it is difficult to assess intelligence without involving language to some degree in the task itself. Performance tests attempt to avoid this dilemma with hearing impaired students by minimizing the use of language. Giving instructions remains a potential problem nonetheless, and the examiner must be certain that the student understands.

The Wechsler Intelligence Scale for Children-Revised (WISC-R) and the Wechsler Adult Intelligence Scale-Revised (WAIS-R) performance scales are perhaps the most frequently used tests for assessing intelligence of hearing impaired students. Both scales have many strengths for this purpose, and the

WISC-R has the added benefit of having hearing impaired norms. The Leiter International Performance Scale and the Hiskey-Nebraska Test of Learning Aptitude are also useful and provide measures of quantitative ability and memory.

It is generally considered safe to quote a WISC-R or WAIS-R performance scale as a good estimate of the hearing impaired student's intelligence level, and this has practical significance. However, there are dangers associated with using this score as the only measure of cognitive functioning, and the results should be validated by other measures of intelligence. For example, two hearing impaired students of widely differing cognitive ability, especially in the domain of verbal intelligence, may have exactly the same performance scale IQ on the Wechsler scales. This may occur, even though the Wechsler scales are good measures of general intelligence; the depressions on the performance scale of the highly verbal student may reflect deficits that are not present in the verbal areas of this individual.

The verbal scale IQ is seldom considered a valid measure of the hearing impaired student's intelligence. Nonetheless, the sensitive administration of the verbal scale subtests of the Wechsler scales, for example, the Similarities, Information, Comprehension, and Arithmetic subtests, may provide some information regarding the student's problem-solving abilities, attention span, and practical knowledge about the world. This use, of course, is clinical rather than psychometric and may give valuable insights regarding the student's facility with English, including his cognitive style and sophistication. This information can be especially helpful in assessing

a child's ability to function in a mainstreamed situation with hearing children. If these subtests are administered, the reasons for so doing and any limitations in their interpretation should be stated.

Questionnaires for Assessment of Personality

Questionnaires are not good instruments for the assessment of a hearing impaired student's personality because of their dependence on English. Even when the hearing impaired person has excellent English skills, one should proceed with caution because there are several items in most instruments whose content is inappropriate for hearing impaired people. In general, however, the use of questionnaires is not recommended. Sentence completion tests may be used, but only if the hearing impaired student has good English skills, and the results are interpreted with caution. These can also be administered in a nonwritten form by signing the beginning of the sentence and recording the student's signed response.

Projective Instruments for Assessment of Personality

Most psychologists use various forms of figure drawings as a means of assessing the developmental level of children as well as the salient clinical themes within the personality. The use of apperception tests can be excellent devices for eliciting projection by hearing impaired students, yielding important themes within the personality. It is usually necessary to

ask more questions to elicit content because hearing impaired children often have a difficult time with spontaneous, open-ended dialogue. This changes the structure of the task and is reported in the interpretation of results.

BEHAVIORAL OBSERVATIONS

Behavioral observations provide a means of for cross-validation of test findings and clinical impressions, and refer to all procedures in which children are observed. These can include the interaction of children with their mothers or other family members, interaction with peers in the playroom or classroom, classroom behavior, and play with selected materials in the playroom with the examiner. The child's style and preoccupation with themes of nurturance, dominance, power, aggression, sexuality, and the like are observed. The examiner is always interested in creativity, self-control and limits-setting, reciprocity, humor, reality-testing, evidence of variety in fantasy, and in a host of other clinical manifestations in their behavior. Important insights about the child's developmental levels can be reached through this approach. Such observations require the observer to be fluent in the language and modes of communication used by the student in these various settings.

WRITTEN REPORT

A good psychological report about a hearing impaired student has the usual components, which include age of the client, date of birth, place of examination, referral sources, reason for referral, behavioral observations,

and test-taking attitudes. The following additional statements should be included: (1) how communication occurred, the type of language used, and whether an interpreter was present; (2) information about the student's hearing impairment: etiology, degree of loss, age at onset, educational background, hearing status of the parents and other family members and a statement concerning how the hearing impairment was considered in making interpretations; (3) what tests were used, why they were appropriate for this student with a specific rationale for using any language-based tests; and (4) test scores, along with appropriate normative information.

REFERENCES

Hiskey, M.S. (1955). Nebraska Test of Learning Aptitude for Young Deaf Children. Lincoln, Nebraska: University of Nebraska Press.

Leiter, R. (1948). Leiter International Performance Scale. Chicago Illinois: Stoetting.

Meadow, K.P. (1983). Meadow-Kendall Social Emotional Assessment Inventories for Deaf and Hearing Impaired Students. Washington, D.C.: Gallaudet College.

Sparrow S., et al. (1985). Vineland Adaptive Behavior Scales. Circle Pines, Minnesota: American Guidance Service.

Wechsler, D. (1958). The Measurement and Appraisal of Adult Intelligence. 4th ed. Baltimore, Maryland: Williams and Wilkins.

Wechsler, D. (1974). Wechsler Intelligence Scale for Children - Revised. New York: The Psychological Corporation.

CHAPTER 7

LEARNING EVALUATION

The purpose of an educational assessment is not only to acquire information regarding learning style and current levels of conceptual, cognitive, academic, communication and perceptual motor functioning, but also to determine the most appropriate instructional strategies, classroom materials and environment for optimal learning to occur. When a student is hearing impaired, the test modifications required to accommodate a sensory deficit will affect the types of information gathered, the manner in which such information is gained and the subsequent interpretation of this information. Consideration must be given to the specific demands of the assessment tasks presented and the impact hearing impairment and concomitant language deficits may have upon the student's ability to perform those tasks.

INFORMATION PROVIDED BY THIS EVALUATION

This learning evaluation provides insight into how the student learns, explores explanations for any learning difficulties and identifies the factors which are critical in developing an instructional plan. The learning evaluation provides information on the student's educational development in reading (word recognition, word analysis, structural analysis, word comprehension, passage comprehension), arithmetic (quantitative concepts,

calculations, application for problem solving), written composition and spelling (handwriting, mechanics, punctuation, word usage, thematic maturity), knowledge of content areas such as science and social studies, visual/haptic/auditory perception, coarse modal perception, memory, fine/gross motor functioning and receptive/expressive communication skills.

Following assessment, the examiner develops a profile of strengths and weaknesses which will assist in determining the type of educational program (self-contained, mainstream, resource room), the mode of communication most efficient for learning activities (total communication, oral/aural), the instructional implications, FM amplification if warranted, and the modifications required in the learning environment (preferential seating, use of cubicles). The examiner also suggests the types of classroom materials which are compatible with the student's learning style and communication strengths, defines appropriate instructional goals and objectives and provides teachers with instructional strategies indicated for the student.

EXPERTISE OF THE EXAMINER

In addition to the recognized professional skills indicated for educational evaluation, the examiner evaluating a hearing impaired student is familiar with deafness as a complex impairment, the ramifications of which are determined by the etiology, degree and type of hearing loss, age of onset, age of identification and occurrence of familial deafness. A thorough knowledge of the characteristics of the central nervous system involvement associated with a learning disability and the characteristics of the

peripheral nervous system involvement associated with hearing impairment is critical, since some of the subtle manifestations of deafness might be mistakenly attributed to learning disability and vice-versa. For example, the attentional difficulties seen in children with learning disabilities may also be seen in children who are hearing impaired. However, in each instance, the cause is different, requiring a different intervention.

The examiner is able to interpret the information provided in the audiological and communication assessments and to consider the educational implications of each. A full understanding of the differences between conductive, sensorineural and mixed types, mild, moderate, severe and profound degrees, speech discrimination thresholds, use of residual hearing, speechreading skills and language level allows the examiner to develop an adequate assessment guide from which to select instruments and make appropriate instructional recommendations. The examiner is sensitive to delayed language and to the deviations in language acquisition reflected in the comprehension and use of concept words, prepositions, and the ability to process connected information in hearing impaired students. The characteristic comprehension strategies of the hearing impaired, such as order of mention rather than order of occurrence, should be clear to an examiner responsible for reporting information about the processes of thinking, listening, speaking, reading and writing.

The examiner selects appropriate assessment instruments from among those which are specific to the hearing impaired and those which are not. Flexibility in administering certain instruments and interpreting the results

is required. The task at hand, that is, the acquisition of detailed information regarding the youngster's learning style and current levels of performance, demands that modifications be made which may include the administration of practice or demonstration items, use of modeling, pantomine or manual communication techniques to administer items, ability to determine if specific test items discriminate against a hearing impaired individual and examination of the normative sample relevant to specific instruments. Any modifications in administration of test items necessitate an understanding of the impact this has upon the validity of results. The examiner analyzes errors and differentiates those arising from the hearing impairment and language deficits from those indicative of specific learning disability. Since, by definition, both impairments involve delays or disorders in language based processes, resultant behaviors may be similar but attributable to significantly different causes.

STRATEGIES

Strategies for securing required information include a review of records already in existence. These may include not only educational materials but those generated by medical and audiological personnel. The examiner consults with the classroom teacher and ancillary school personnel if indicated. Effective consultation draws upon the examiner's knowledge of the curriculum being used and the effects of any modifications made, the type of program in which the student is placed and the philosophical implications of that program. Observation of the student outside of the testing situation

requires particular sensitivity to the social, emotional and linguistic characteristics of the hearing impaired individual.

In formal testing situations, the examiner's freedom to use situational/ contextual cues to enhance the student's comprehension is often limited. The apparent discrepancies observed between a hearing impaired student's functioning in familiar settings (home, classroom) and formal settings such as in testing, may be caused by this limitation. Since formal instruments tend to measure narrow comprehension, the evaluator places a greater emphasis upon information collected through augmentative informal measures. The evaluator is familiar with the issue of broad vs. narrow comprehension and the compensating behaviors used by hearing impaired students. For example, when reading comprehension passages are limited in length, the passage fails to provide the hearing impaired reader with enough context. When hearing impaired readers are given whole, cohesive passages on topics about which they have had some prior knowledge, they do not have to rely on syntactic information, but can extract meaning based on the information contained in the passage and their own sense of logic.

Individual achievement tests typically used during a learning evaluation do not provide norms for hearing impaired individuals.* The examiner selects those instruments which, with proper interpretation, do not discriminate or measure the ramifications of hearing loss and can be used to the student's

*Note: Stanford Achievement Test does include such norms; however, this is a group test.

level of functioning in a particular sphere. Assessment of math skills, for example, should include a determination of the degree of conceptual understanding of cognitive/linguistic quantitative terms, calculation skills and application abilities for problem solving. The examiner might find it inappropriate to administer traditional word problem items since one may be assessing language skills rather than arithmetic skills. Reading assessment presents particular challenges, since one must be able to relate information regarding the sounds which a student is capable of hearing to the phonic/structural analysis skills the student is able to acquire and apply. Comprehension measures may not provide sufficient contextual cues for hearing impaired students to be able to respond to inquiries, and one may find that errors involve semantic deficits rather than comprehension deficits. Limited opportunities for incidental learning produces a type of cultural deprivation which detracts from the student's fund of general information and negatively affects comprehension. Familiarity with the idiosyncratic writing style of the hearing impaired student allows the examiner to distinguish between the impact of hearing impairment and disordered writing skills. Idiosyncratic writing errors typically include the failure to use inflectional endings or the use of unusual word order.

The examiner may feel that visual and motor systems are assessed in much the same manner as for the hearing student. While this may be true to some degree, the examiner must understand the ways in which weaknesses in these areas may impede manual communication and speechreading skills. Students with spatial-perceptual deficits cannot readily distinguish stationary shapes. They will have significantly more difficulty discriminating the moving, rapidly changing shapes of the hand when signing or the lips when

speaking. Examiners must also not assume that hearing impairment precludes strengths in auditory perception. Understanding the relationship between auditory acuity and auditory perception is critical. The examiner must know when it is appropriate to assess phonic skills or recommend that an auditory strategy be applied for decoding purposes.

Finally, the examiner is knowledgable of the literature reporting educational trends and expectations for hearing impaired students. This will assist the examiner in comparing students with a peer group in the absence of normative data.

Chapter 8

EVALUATION OF STUDENTS WITH ADDITIONAL HANDICAPPING CONDITIONS

The guidelines presented in the previous chapters are relevant to all hearing impaired students. The primary intention of this brief discussion is to alert the reader to considerations in evaluating hearing impaired students with additional handicaps.

BACKGROUND/DEFINITION

The incidence of hearing impairment as an isolated disabling condition may seriously affect an individual's ability to optimally develop language and communicate with others. Consequently, this developmental and functional imposition affects an individual's ability to learn. When hearing impairment is combined with one or more additional handicapping conditions, the effects become compounding rather than additive. Any handicap in addition to a hearing loss presents further obstacles in the student's ability to progress developmentally and limits that student's avenues for compensation. For the purposes of these guidelines, a hearing impaired individual will be considered multiply handicapped if any physical, mental, emotional, and/or behavioral disorder is present that significantly adds to the complexity of evaluating and educating that individual.

In order to discuss the implications for the evaluation of hearing impaired students who have additional handicaps, it is critical to address the nature

and prevalence of this incidence. The innumerable variables involved in the identification and the subsequent delivery of appropriate educational and habilitative services to this heterogenous group of hearing impaired children present obvious difficulties. The child study team will consider the nature and severity of a child's hearing impairment and the additional handicapping condition(s) as they develop and implement an evaluation plan. For example, the individual who presents serious visual impairment in addition to a congenital profound hearing loss requires specific considerations in the evaluation process. These considerations differ greatly from those of an individual who presents severe mental retardation in conjunction with a hearing loss. The heterogeneous nature of this population dictates a highly individualized approach to evaluation, and consequently it is inappropriate to suggest a specific test battery or evaluation strategy.

The primary etiologies of deafness are known to result in a variety of other disabilities. Twenty-nine percent of students with hearing impairment present one or more additional handicaps (Center for Assessment and Demographic Studies, Gallaudet University, 1986). Prenatal rubella, Rh factor complications, meningitis, genetics, and prematurity are documented as leading causes of congenital deafness and a variety of other disabilities. These other disabilities include neurological impairment, cardiac/pulmonary disorders, mental retardation, orthopedic disorders, visual impairment, structural deformities, learning disabilities, emotional/behavioral problems and perceptual/motor disorders.

Current literature and available data imply that there has been an increase in the number of hearing impaired students with multiply handicapping conditions. However, this is largely due to changes in data collection procedures. The actual incidence of these students in terms of the total population of hearing impaired students has not risen significantly. Increased identification of this incidence, coupled with the state and federal requirements, has resulted in programs providing a greater array of educational services. Special education programs are critically examining the educational services that these children require. Protocols for identification, classification, and program design involve professionals from a variety of disciplines and require an array of strategies for assessment.

INFORMATION PROVIDED BY THIS EVALUATION

The hearing impaired child with multiply handicapping conditions requires assessment in all educationally relevant domains. These domains include the areas of cognition, learning, sensory, communication, physical, and social/emotional. The student's present status in these domains is frequently determined through the use of norm-referenced assessment tools. These tools generate the extent of deviation from the norm in a given developmental area. Conclusions based solely on norm-referenced assessment often reflect inaccurate indicators of the student's future developmental limits and do not provide the comprehensive information necessary to design an individualized education program. The evaluation plan must focus upon how the student performs rather than deviations from the norm. However, identifying current developmental levels may offer information which

influences programmatic design and is used in conjunction with other methods of assessment.

Criterion-referenced measures are used to determine the extent of deviation from skill levels necessary for optimal independent functioning. These procedures may involve surveying the present environment for both critical and performance-relevant skills. These skills are critical to independence and include varied activities of daily living, personal care, mobility/orientation, community living, etc. The environments to be surveyed include home, school and community. This evaluation process obtains impressions, information, and programming priorities from the child's significant others (mother, father, etc.). This assessment procedure is often referred to as an ecological survey. It provides useful information on present levels of functioning across various dimensions (time, place, etc.) and generates the evaluative information necessary to construct a functional educational plan.

The hearing impaired child with multiply handicapping conditions is difficult to assess with the use of formal instruments alone. Assessment and diagnosis are typically viewed as a continual process in which consistent on-going observation and data collection are required. These informal assessment strategies include structured observation, probes, task analyses, criterion-referenced tools, case histories, interviews and ecological skill inventories. The application of diagnostic-prescriptive teaching provides the avenue to assess abbreviated increments of progress that are indicators of successful or unsuccessful intervention. This implies that the evaluation

process involving a hearing impaired student with multiple handicaps must be specific and on-going.

Assessment strategies are conducted in the student's preferred mode of communication and comply with federal requirements regarding testing the student in his/her native language. The evaluation plan specifies the student's most efficient system(s) of communication. Many students use non-linguistic communication strategies such as gestures, facial expressions idiosyncratic signs, or even aberrant behaviors. Both the procedures utilized and the interpretation of the results should reflect the avenues in which intentions are communicated as well as the associated cognitive and motor implications to current communication/language functioning. For example, students who present cognitive delays may not have the ability to use symbols (non-representational). Thus communication must not include representations, and sign language would be inappropriate. This student may be effectively communicating through the use of gestures, facial expression, etc. In addition, any attempts to communicate through inefficient and/or undesirable methods such as aberrant behaviors must be recognized.

EXPERTISE OF THE EXAMINER

The process of evaluating the hearing impaired student who is multiply handicapped involves the participation of a group of professionals representing a variety of disciplines. The composition of this core team will depend on the individual student, but must minimally include a psychologist, audiologist, speech/language specialist, social worker, and learning disabilities teacher consultant. The specific nature and severity

of the student's handicaps may require participation of additional team members such as a physical therapist, occupational therapist, vision specialist or teacher of the hearing impaired. For example, a student who has motor involvement would require a physician and a physical/occupational therapist as part of the evaluation team.

Each member of this interdisciplinary team is knowledgeable in the effects of hearing impairment as well as the concomitant effects of the other handicapping conditions (specifically as it pertains to each individual discipline). As addressed earlier, the presence of additional handicaps demonstrates a compounding rather than additive effect on an individual's ability to learn.

The vast combinations of handicaps and degrees of severity represented in this group of students often require the evaluation team to work extremely closely to realize the most accurate assessment results. Ideally, the evaluation team operates within a transdisciplinary process model. Although a transdisciplinary approach to assessment and intervention may have varied operational definitions, in all cases this process offers the opportunity for the individual disciplines to work together in evaluating a student. Through the use of a transdisciplinary approach, each team member obtains information that crosses disciplines, integrates assessment results to produce information that reflects the whole child, and represents each other when working with parents and programs.

CHAPTER 9

GENERAL CONSIDERATIONS FOR PROGRAMMING

The evaluation process culminates in a series of meetings in which the assessment findings are reviewed and synthesized. The child study team must determine if the student is eligible for special education and/or related services. If the student is eligible, the team coordinates the development of the basic plan section of the individualized education program (IEP) and, with the assistance of the classroom teacher, the instructional guide. This chapter outlines broad issues in programming for hearing impaired children. It does not provide the specificity required for developing IEPs.

Programs designed for children and youth with educationally significant hearing impairment include aural habilitation, the development of augmentative communication strategies and a specialized instructional program. Aural habilitation requires ongoing assessment of the student's functional hearing, constant attention to the proper use of hearing aids, FM auditory systems and the like, and a prescriptive approach to auditory training and instruction. Augmentative communication strategies would include the use of sign systems, telecommunication devices for the deaf (TDDs), interpreters, captioning and so forth. The design of a specialized program would consider both the explicit and implicit learning abilities of the student and would incorporate instructional strategies which capitalize upon the student's communicative strengths. The habilitative aspect of the program is infused throughout the instructional day.

Children and youth with educationally significant hearing impairment fall into two broad categories of communicative behavior, although there is no sharp line dividing these groups. In one category are those children who rely primarily upon vision for communication. We generally refer to these children as deaf children. In the other category are those children who rely primarily upon hearing, albeit impaired hearing. We refer to these children as hard of hearing children. There are many other ways to define "deaf" and "hard of hearing." The most common definitions of deaf and hard of hearing are based upon a decibel loss, although children with identical decibel losses may function very differently due to a variety of factors. This functional distinction will assist the child study team in its determination of least restrictive environment.

Programs for hard of hearing children utilize the auditory modality as the primary channel for communication. Because of the impaired nature of the child's hearing, special attention is given to assure that the acoustical environment is accessible. The student must be aided properly, and the environment is acoustically controlled to reduce ambient noise. Many hard of hearing children depend upon visual cues, such as speechreading or captioning, in order to comprehend speech. These children are provided with preferential seating in the classroom or the auditorium. Teachers and others in the school setting are aware of the child's communicative strategies, expressively and receptively, and adjust their communicative style to accommodate the child's abilities.

Programs for hard of hearing children are generally provided in the mainstream, resource room or in an auditorily handicapped classroom with

other children who communicate similarly. Intervention by qualified specialists at a young age frequently results in the child's later success in a regular education environment with support services. Some hard-of-hearing children will continue to require special class placement throughout their school careers, especially if there are other factors affecting their performance in school.

Programs for deaf children utilize the visual modality as the primary channel for communication. As adults, deaf people rely heavily upon vision for communication. Because English language skills including speech, reading, writing and even speechreading are normally developed through hearing, the development of these skills in deaf children is a monumental task. Residual hearing continues to play a critical role in speech and language development, and programs provide both therapy and instruction to enable students to make maximal use of their hearing. However, the impairment is so severe that vision provides a more efficient channel for communication.

In programs for deaf children, special attention is given to structuring the visual environment. Verbal information is visually coded and visual distractions are reduced. Because many deaf children use their residual hearing, the environment is also acoustically controlled.

Programs for deaf children are provided in special schools, special classes or in mainstreamed settings with intensive support services. Intervention by qualified specialists at a young age provides deaf children with the greatest chance to develop speech and language skills. Even so, most deaf children

will continue to require intensive special education services throughout their school career.

Two major philosophies regarding the education of deaf children are the auditory/oral philosophy and the total communication philosophy. The major point of contention between these philosophies is the value of sign systems as an augmentative communication tool in the education of deaf children. The auditory/oral philosophy maintains that a deaf child's educational goals in communication, general education and self-concept can be best accomplished without the use of any sign system. The total communication philosophy maintains that the use of sign as one of its tools makes the educational system more efficient. Each philosophy outlines an approach to education which is valid for some deaf children and not for others. Because the implementation of either philosophy has ramifications which impact upon the home and community environment, the decision about which philosophy to apply for a given student must be made jointly by the parent and by the school.

The development of programs for deaf children presents a multitude of dilemmas to be faced from the outset. The evaluation team and parents must design an educational program for a child whose access to the information in his/her environment is fundamentally different from others at home, in the school and in the community. The education program must maximize the child's chances to be fully integrated in society and yet recognize and address the uniqueness of the child's circumstances.

BIBLIOGRAPHY

Arkell, C. "Assessment of Multiply Handicapped Deaf Students for Program Development." American Annals of the Deaf, 1981, 126(5), 526-532.

Bess, F., B. Freeman, & J.S. Sinclair, eds. Amplification in Education. Washington, D.C.: A.G. Bell Association for the Deaf, 1981.

Baker, C. & D. Cokely. American Sign Language: A Teacher's Resource Text on Grammar and Culture. Silver Spring, Maryland: T.J. Publishers, Inc., 1980.

Blackwell, P.M., E. Engen, J.E. Fischgrund & C. Zarcadoolas. Sentences and Other Systems: A Language and Learning Curriculum for Hearing-Impaired Children. Washington, D.C.: The Alexander Graham Bell Association for the Deaf, 1978.

Bloom, L. & M. Lahey. Language Development and Language Disorders. New York: John Wiley and Sons, 1978.

Cokely, D. Sign Language Overview: Assessment Workshop. Washington, D.C.: Gallaudet College, Pre-College Programs, 1980.

Committee on Audiometric Evaluation. Guidelines for Identification Audiometry. Rockville Pike, Maryland: ASHA, 1984.

Eisenberg, D. Speech assessment Overview One: Assessment Workshop. Washington, D.C.: Gallaudet College, Pre-College Programs, revised 1983.

Ewoldt, C. "Reading for the Hearing Impaired: A Single Process." American Annals for the Deaf, 1978, 123, 945-948.

Feuerstein, R. The Dynamic Assessment of Retarded Performers. Baltimore, Maryland: University Park Press, 1979.

Gorman, R.M. Discovering Piaget: A Guide for Teachers. Columbus, Ohio: Charles E. Merrill Publishing Co., 1972.

Hobbs, P. Learning Overview/Secondary Level: Assessment Workshop. Washington, D.C.: Gallaudet College, Pre-College Programs, 1980.

Hocketts C.F. A Course in Modern Linguistics. New York: Macmillan, 1958.

Johnson, D.D. et al., eds. Communication Performance Evaluation with Deaf Students: A Review. New York: National Technical Institute for the Deaf, 1979. (Report No. NTID/TAP/EE-80/0100).

Kavanagh, J., ed. Otitis Media and Child Development. Parkton, Maryland: New York Press, 1986.

Keith, R., ed. Central Auditory and Language Disorders in Children. San Diego, California: College Hill Press, 1982.

Kretschmer, R.E. "Assessing the Hearing Impaired Child." In Ray Steven, Michael O'Neill & Nancy Morris, eds. Low Incidence Children: A Guide to Psychoeducational Assessment. Sulphur, Oklahoma: Steven Ray Pub., 1983.

Kretschmer, R.E., ed. "Reading and the Hearing-Impaired Individual." Volta Review, 1982, 84 (No. 5).

Kretschmer, R. E., Jr., & L.W. Kretschmer. Language Development and Intervention with the Hearing Impaired. Baltimore, Maryland: University Park Press, 1978.

Labinowicz, E. The Piaget Primer: Thinking, Learning, Teaching. Menlo Park, California: Addison-Wesley Publishing Company, 1980.

Lennan, R.K. "Educational Assessment for Placement." Directions, 1980, 1, 22-25.

Martin, F. Introduction to Audiology (third edition). Englewood Cliffs, New Jersey: Prentice Hall, 1986.

Matkin, N. "Assessment of Hearing Sensitivity during the Preschool Years." In F. Bess, ed., Childhood Deafness: Causation, Assessment, and Management. Orlando, Florida: Grune & Stratton, 1977.

Myers, S. "A General Overview of Disabilities and Handicaps." In S. Welsh & R. Hozberg, eds. Understanding and Educating the Deaf-Blind/Severely and Profoundly Handicapped. Springfield, Illinois: C.C. Thomas, 1981.

Newby, S. Learning Overview/Elementary Level: Assessment Workshop. Washington, D.C.: Gallaudet College, Pre-College Programs, 1980.

Northern, J. & M. Downs. Hearing in Children (2nd edition). Baltimore, Maryland: William & Wilkins, 1978.

Nussbaum, D. Audiological Overview: Assessment Workshop. Washington, D.C.: Gallaudet College, Pre-College Programs, 1980.

Quigley, S.P. & R.E. Kretschmer. The Education of Deaf Children: Issues, Theory and Practice. Baltimore, Maryland: University Park Press, 1982.

Ross, M. & T. Gilas, eds. Auditory Management of Hearing Impaired Children. Baltimore, Maryland: University Park Press, 1978.

Salvia, J. & J. Ysseldyke. Assessment in Special & Remedial Education. Boston: Houghton - Mifflin, 1981.

Semel, D. & E.H. Wiig. Language Disabilities in Children and Adolescents. Columbus, Ohio: Charles E. Merrill, 1976.

Sims, D.G., W. Whitehead & R.L. Whitehead, eds. Deafness and Communication: Assessment and Training. Baltimore, Maryland: Williams and Wilkins, 1982.

Smith, R. Comprehension and Learning. New York: Holt, Rhinehart and Winston, 1975.

Snell, M.E. Systematic Instruction of the Moderately and Severely Handicapped. Columbus, Ohio: Charles E. Merrill, 1983.

Sund, R.B. Piaget for Educators. Columbus, Ohio: Charles E. Merrill, 1976.

Tweedie, D. & E. Shroyer, eds. The Multi-Handicapped Hearing Impaired: Identification and Instruction. Washington, D.C.: Gallaudet College Press, 1982.

Vernon, M. "Multihandicapped Deaf Children: Types and Causes." In D. Tweedie & E.H. Shroyer, eds. The Multihandicapped Hearing Impaired: Identification and Instruction. Washington, D.C.: Gallaudet College Press, 1982.

Vygotsky, L.S. Thought and Language. Cambridge, Massachusetts: MIT Press, 1962.

Zieziula, F.R. Assessment of Hearing-Impaired People: A Guide for Selecting Psychological, Educational and Vocational Tests. Washington, D.C.: Gallaudet College Press, 1983.

RB/pe:1/3009k